

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 03 003 6FC	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, Item 5 below.	
International application No. PCT/EP2004/010501	International filing date (day/month/year) 18/09/2004	(Earliest) Priority Date (day/month/year) 20/09/2003
Applicant UMICORE AG & CO KG		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box II).

3. ☐ **Unity of invention is lacking** (see Box III).

**4. With regard to the title,**

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

**5. With regard to the abstract,**

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

**6. With regard to the drawings,**

a. the figure of the **drawings** to be published with the abstract is Figure No. 2c

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2004/010501

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 H01M8/02 H01M8/10

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 475 656 B1 (KOSCHANY ARTHUR ET AL) 5 November 2002 (2002-11-05)  claims 1-36	1,2,4-8, 10-13, 16,17
X	DE 199 26 027 A (HELIOCENTRIS ENERGIESYSTEME GM) 30 November 2000 (2000-11-30) the whole document	1,2,4-8, 10-13, 16,17
X	DE 199 03 352 A (SIEMENS AG) 10 August 2000 (2000-08-10) the whole document	1,2,4-8, 11,16
X	WO 00/10215 A (BOENSEL HARALD ;DECKERS GREGOR (DE); GEBHARDT ULRICH (DE); SIEMENS) 24 February 2000 (2000-02-24) claims 1-4	1
A		2-17

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the international search

22 February 2005

Date of mailing of the international search report

02/03/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Battistig, M

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2004/010501

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6475656	B1	05-11-2002	DE 19703214 C1 AT 254804 T AU 6617298 A CA 2279206 A1 CN 1251212 T DE 59810221 D1 WO 9833225 A1 EP 0966770 A1 ES 2212269 T3 JP 2001509304 T	05-11-1998 15-12-2003 18-08-1998 30-07-1998 19-04-2000 24-12-2003 30-07-1998 29-12-1999 16-07-2004 10-07-2001
DE 19926027	A	30-11-2000	DE 19926027 A1 AT 246406 T AU 6258900 A WO 0074161 A1 DE 10081495 D2 DE 50003126 D1 EP 1188198 A1 US 6756147 B1	30-11-2000 15-08-2003 18-12-2000 07-12-2000 11-07-2002 04-09-2003 20-03-2002 29-06-2004
DE 19903352	A	10-08-2000	DE 19903352 A1 AT 230895 T CA 2359733 A1 CN 1339179 T WO 0045454 A1 DE 50001040 D1 DK 1153451 T3 EP 1153451 A1 ES 2190401 T3 JP 2002536789 T US 2002015873 A1	10-08-2000 15-01-2003 03-08-2000 06-03-2002 03-08-2000 13-02-2003 22-04-2003 14-11-2001 01-08-2003 29-10-2002 07-02-2002
WO 0010215	A	24-02-2000	CA 2340046 A1 CN 1346522 T WO 0010215 A1 EP 1114483 A1 JP 2002533869 T US 6852440 B1	24-02-2000 24-04-2002 24-02-2000 11-07-2001 08-10-2002 08-02-2005

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

## PCT

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/EP2004/010501

International filing date (day/month/year)  
18.09.2004

Priority date (day/month/year)  
20.09.2003

International Patent Classification (IPC) or both national classification and IPC  
H01M8/02, H01M8/10

Applicant  
UMICORE AG & CO KG

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk - Pays Bas  
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl  
Fax: +31 70 340 - 3016

Authorized Officer

Battistig, M

Telephone No. +31 70 340-3738



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**International application No.  
PCT/EP2004/010501**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

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PCT/EP2004/010501

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**Box No. V Reasoned statement under Rule 43b/s.1(a)(I) with regard to novelty, inventive step or  
Industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	3,9,14,15
	No: Claims	1,2,4-8,10-13,16,17
Inventive step (IS)	Yes: Claims	3,9,14,15
	No: Claims	1,2,4-8,10-13,16,17
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/EP2004/010501

This opinion is being carried out on **the application documents as originally filed**.  
Reference is made to the following documents/:

- D1: US-B1-6 475 656 (KOSCHANY ARTHUR ET AL) 5 November 2002 (2002-11-05)
- D2: DE 199 26 027 A (HELIOCENTRIS ENERGIESYSTEME GM) 30 November 2000 (2000-11-30)
- D3: DE 199 03 352 A (SIEMENS AG) 10 August 2000 (2000-08-10)

**1) Novelty:**

Document D1 or D2 describes a catalyst-coated ion-conducting membrane, a membrane - electrode assembly , a process for producing such membrane and the use of such membrane in electrochemical devices having all the features disclosed in claims 1,2, 4 to 8, 10 to 13 , 16 and 17. The subject-matter of these claims is therefore not novel.

The subject-matter of claims 1, 2, 4 to 8 , 11 and 16 is also disclosed in document D3.

The subject-matter of these claims is therefore also not new.

The subject-matter of claims 3 and 9 is novel because the features of a sealing material contacting the membrane in an edge region of at least 1 mm on one side has not been disclosed in any cited document.

The subject-matter of claims 14 and 15 is novel because the range of pressure and temperature applied has not been disclosed in any cited document.

**2) Inventive step:**

Claims 1,2,4 to 8, 10 to 13, 16 and 17 do not appear to involve an inventive step.

Document D1 is considered to represent the closest prior art, and differs from the subject-



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/EP2004/010501

matter of claims 3 and 9 in that the width of the sealing region is not disclosed and the anode and cathodes are not coated on the membrane. It is not obvious for the skilled person starting from D1 to define the minimum sealing width when using an already coated membrane.

D1 differs from the subject-matter of claims 14 and 15 in that the pressure and temperature range of the forming step are not disclosed.

It is also not obvious, starting from D1 to define the pressure and temperature range to be applied when aiming at an improved tightness of the seal.

The subject-matter of claims 3,9,14 and 15 do appear to involve an inventive step.